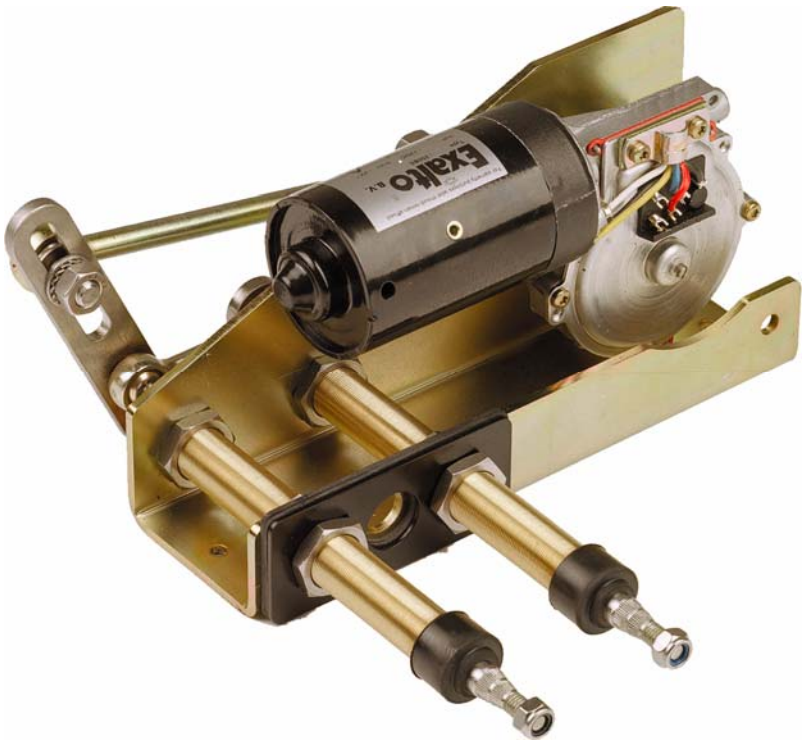
USER MANUAL

Exalto windshield wiper type 250 BS 12/24 Volt

Catalogue Nr. 2175.30/35 (12 Volt)

Catalogue Nr. 2176.30/35 (24 Volt)

version 6 - 2007



Exalto B.V.
Nijverheidsstraat 12 • 3371 XE Hardinxveld-Giessendam
P.O. Box 40 • 3370 AA Hardinxveld-Giessendam
Telephone: +31 (0)184-615800 • Fax: +31 (0)184-614045
The Netherlands
sales@exalto.com

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Safety

Although Exalto windshield wipers are easy to install, a fair amount of technical knowledge (mechanical and electrical) is required of the technician. Consult the manual or your vendor in case of doubt on installation or functioning.

Safety symbols

! An exclamation mark in front of the text indicates, if a procedure is executed incorrectly, injury or damage may occur

Dangers

The installation and use of Exalto wipers doesn't inflict any personal dangers or damage, provided that installation is done according to the requirements.

- Never remove covers or other safety provisions, unless maintenance is being performed and all safety requirements are obeyed.
- The installer must provide all necessary covers.
- ! Always isolate the electrical circuit when performing maintenance. Prevent the installation from being started (accidentally) by others.

Safety provisions

Safety provisions protect the user against contact with moving, electrical or hot parts. Some of them must be provided by the installer. There are several safety provisions:

- ! Cover or panel (compelled): covers moving parts and electrical connections. The installer MUST provide a self-made cover or place the wiper behind a panel.
- Make sure the wiper has enough ventilation when placing it behind a panel or cover.
- Place a fuse (see specifications) in the main cable.

Safety requirements

Before the Exalto wiper is installed, we strongly recommend the following:

- Read the entire manual before installation.
- Keep your working environment as well as the wiper parts clean.
- Check to be sure no parts are missing or damaged.
- Use only well maintained tools and have them within reach when installing.
- Handle the parts with care.
- Never install or maintain the wiper with the electrical voltage applied, unless this is specifically mentioned in the manual.
- Clear your tools after installation.

Use of the manual

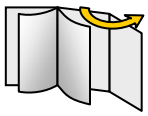
Read the entire manual before installation. In this manual you will find the following expressions and symbols:

Hint!
Gives you advice on how to perform a task more easily.

Attention!
Alerts you to possible problems and safety warnings.

Careful!
Warns if the product can be damaged when working carelessly.

Warning!
You could hurt yourself or damage the product severely.



At the back of the manual
Look at the back of the manual for a drawing.

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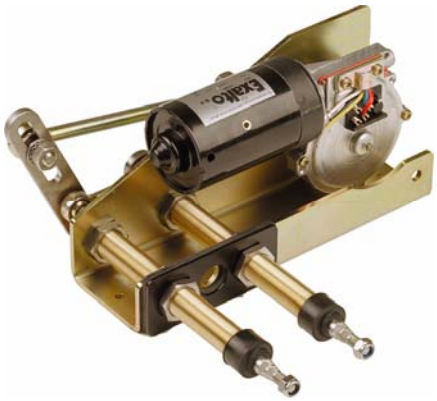
1 Introduction



With this user manual we want to guide you in the installation and use of the Exalto windshield wiper. Follow all instructions and install all safety provisions.

1.1 Introduction

The Exalto windshield wipers are especially designed to keep working even with the most extreme weather conditions at sea. All external parts are made of corrosion resistant materials. The housing of the self-lubricating bearings is made of bronze. All arms and blades have a black, weather-resistant coating, to prevent reflection.

Wiper type 250 BS is designed to be mounted in the bulkhead. The wiper arc is steplessly adjustable from 40° to 90°. By standard the 250 BS can be supplied for bulkhead thicknesses of 35 and 65 mm. The pantograph arms are adjustable in length, to set the wipe area accurately. Both motors of the 250 BS are insulated.

1.2 Environmental factors

In the wiper, materials are used that are harmful for the environment (e.g. copper). Upon disposal of the wiper, parts can be re-used or recycled. No harmful materials are released when using or disassembling the wiper.

1.3 Modified use and guarantee conditions

All modifications or defects in the product are subject to the Orgalime General Conditions of Sale. Contact your vendor if you want to use Exalto wipers for a non-maritime environment or for another application, or in case of any doubt.

2 Technical data

2.1 General

- Product ..... Exalto windshield wiper
- Types ..... 250 BS – 12 Volt and 24 Volt
- Catalogue numbers 12V 2175.30/35
- Catalogue numbers 24V 2176.30/35

2.2 Electrical data 12 Volt

- Torque (max.) ..... 50 Nm
- Voltage ..... 12 Volt
- Current ..... 2.5 A
- Power consumption (max.) ..... 30 W
- Number of revolutions ..... Low 31 rpm, high 50 rpm
- Recommended cable ..... 5 wires, 1½ (16 g) or 2½ mm^2 (14 g)
  ..... up to 10 m long
- Recommended fuse ..... 6 A slow blow
- Grounding ..... Insulated

2.3 Electrical data 24 Volt

- Torque (max.) ..... 50 Nm
- Voltage ..... 24 Volt
- Current ..... 1.3 A
- Power consumption (max.) ..... 30 W
- Number of revolutions ..... Low 31 rpm, high 50 rpm
- Recommended cable ..... 5 wires, 1½ (16 g) or 2½ mm^2 (14 g)
  ..... up to 10 m long
- Recommended fuse ..... 4 A slow blow
- Grounding ..... Insulated

2.4 Mechanical data

- Dimensions ..... l x w x h = 313 x 130 x 142 mm
- Bearing diameters ..... Drive shaft Ø 20/support shaft Ø 20 mm
- Mounting ..... In bulkhead (35 or 65 mm)
- Bearing ..... Bronze housing, self-lubricating
- Wiperarms ..... Model P10 up to 1000 mm
- Wiperblades ..... Up to 1200 mm
- Wipe arc ..... Slotted lever 40°-90° steplessly adjustable
- Weight ..... approx. 4.5 kg

3 Installation

Read the chapter on safety. Check before installation if all parts are present and undamaged. In case of errors, contact your vendor.

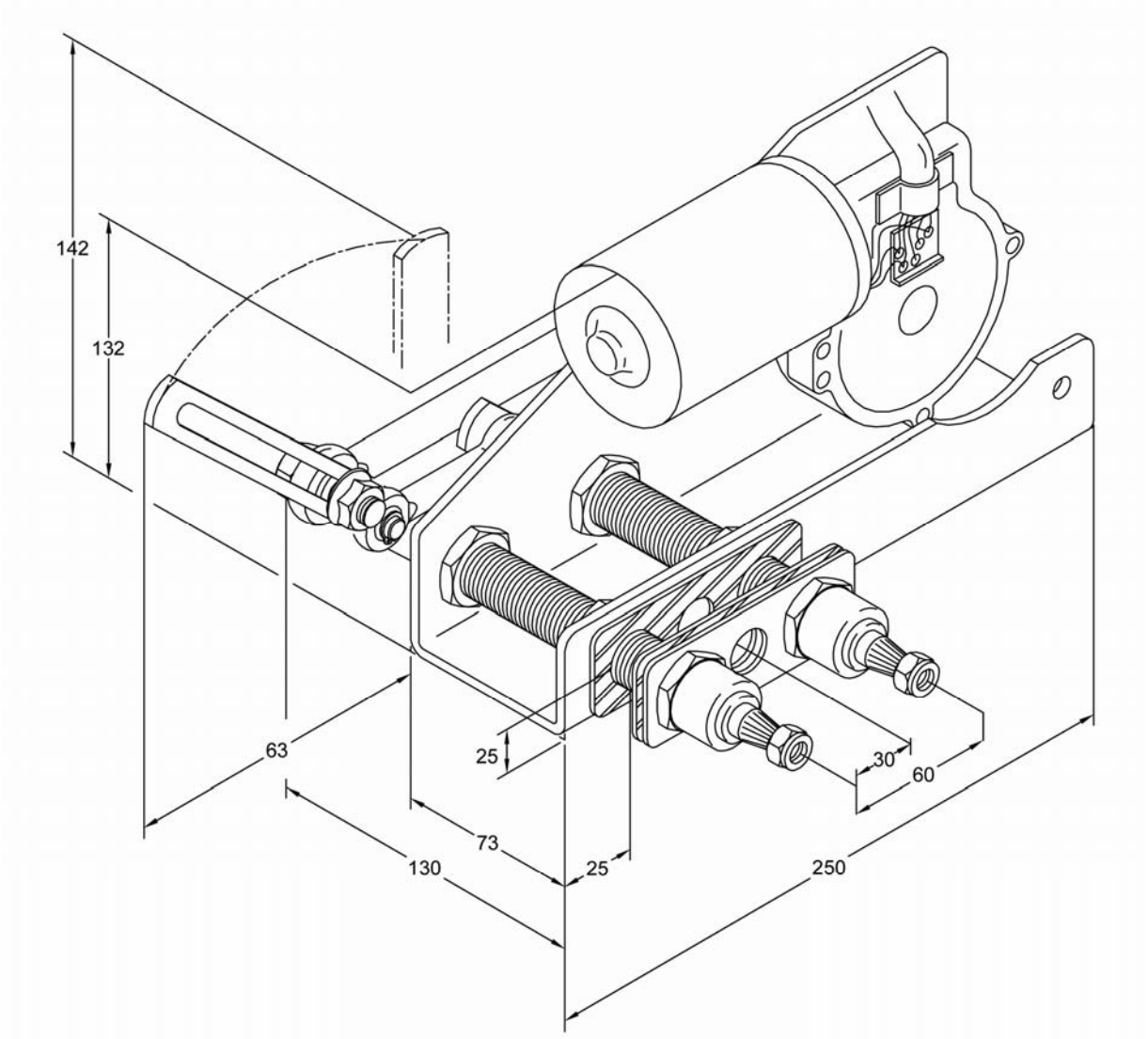
3.1 Preparation

The complete wiper, with packaging, can be handled and transported by hand. Leave the wiper in the packing, until you're ready to install it; this is to reduce the risk of damage. Make sure all parts, tools and other means are ready.

3.2 Installation of mechanical parts

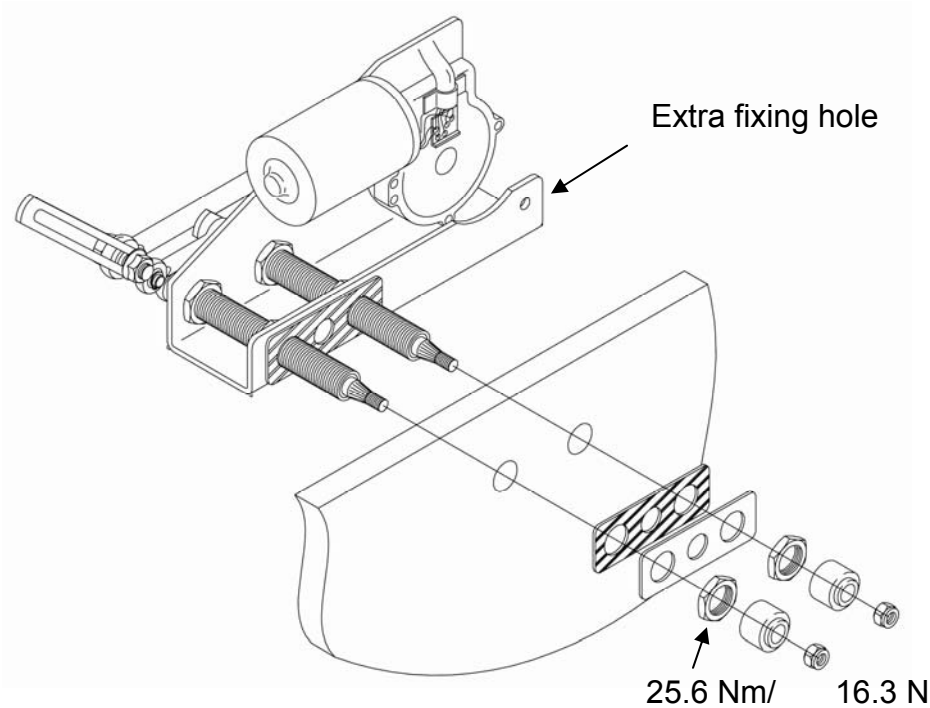
1. If your wiper is supplied with the wipe arc lever uninstalled, please follow steps 5.3 and 5.4 (pages 11-12) to set the wiping arc prior to installation.

   Determine the position where the wiper is to be installed. The dimensions are shown below. The wiper can be installed in any position.



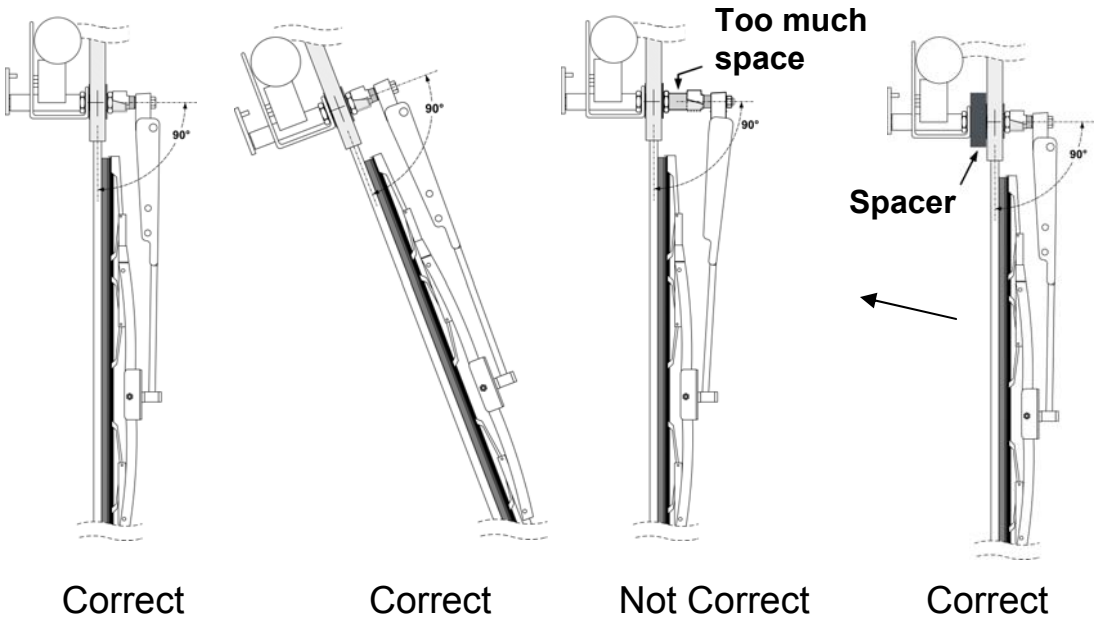
Attention!

When installing the wiper, reserve space for a housing or cover.



2. Place the windshield wiper in the pre-drilled holes of the bulkhead (See above figure). A nitrile plate must be placed at both sides of the bulkhead.

3. To ensure that the arm has the right springpressure, install the wiper arm in such a way that the shaft makes a 90° angle with the window and use a spacer from the inside when there is too much space between the bulkhead and the rubber dustcap.



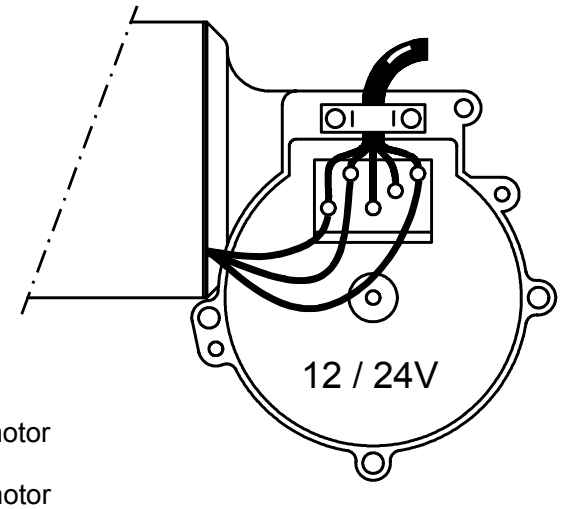
4. Do not fit the wiper arm before finishing the electrical connections.

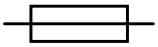
3.3 Electrical installation

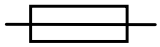
5. Install a wiper switch in the dashboard.

Wiring diagram 250 BS 12 /24 Volt

Colour (since 7-1-99)	Function	Pol
yellow	low speed	+
black	minus/earth	-
blue	common leg	
red	selfparking	+
white	high speed	+




6 A slow blow fuse for 12 Volt motor


4 A slow blow fuse for 24 Volt motor

6. Connect the wiper to the ship's electrical installation; see the schemes above. Use a cable consisting of 5 wires with cross-sections of at least 1½ mm^2 (16 g) up to a maximum of 10 m. Use larger cross-sections when using longer cables.

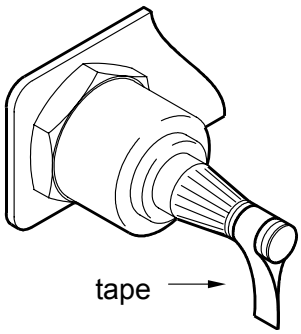
7. Place a slow blow fuse of 6 A (12 Volt) or 4 A (24 Volt) in the main cable.

8. Connect a switch to the wiper (refer to that specific manual for installation).

3.4 Final installation

9. Test the motor briefly. Wait until the motor stops after turning off the switch. If the motor is installed correctly and a switch with park feature is used, it will stop in the park position. The standard park position is shown in the figure under point 9.

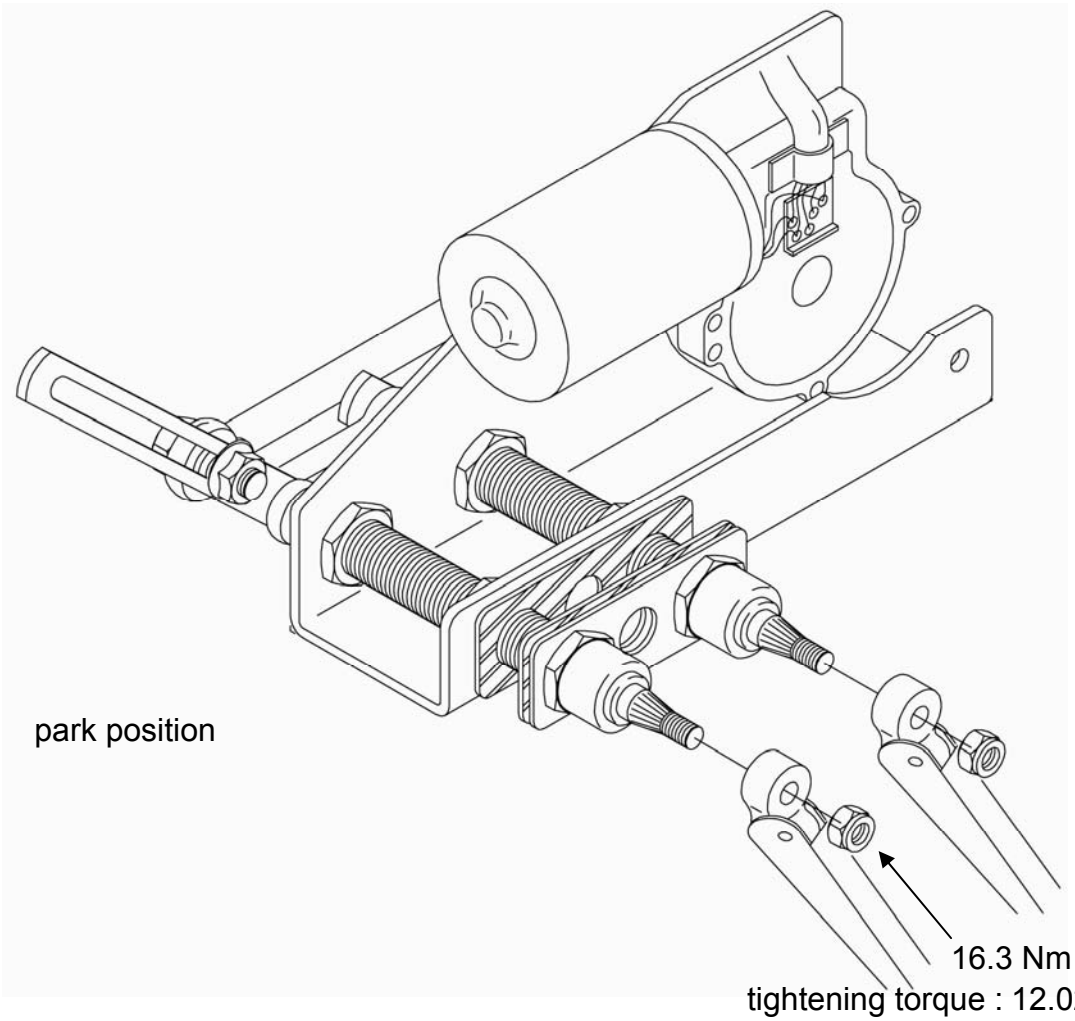
Hint!
If you have doubts regarding the park position, make a vane with tape to simulate the position of the arms.



Attention!
The 250 BS is suitable for wiper arms model P10 up to 1000 mm and matching blades up to 1200 mm.

10. Place the wiper arm with the blade on the shafts. Fasten the nuts onto the shafts, but not too tight yet.

11. Test the motor again to check the wiped area.



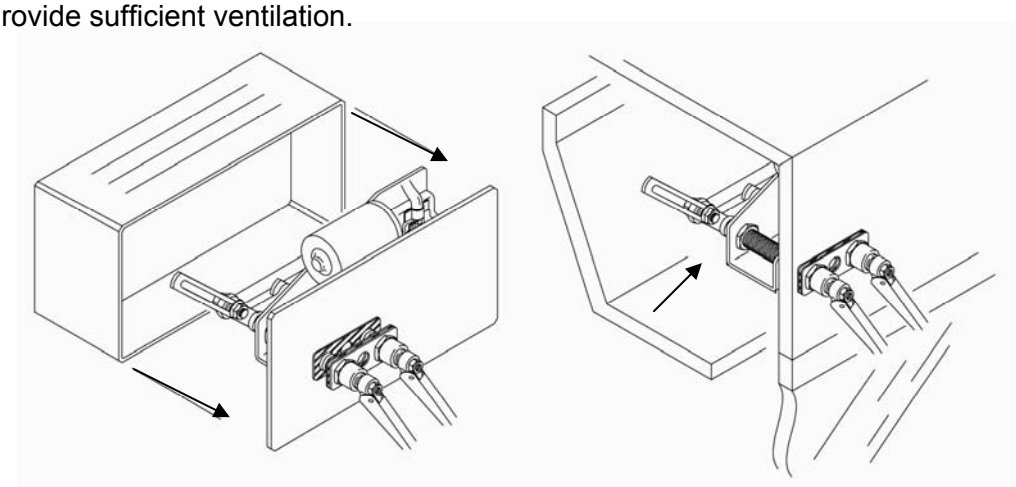
12. If the wiped area is not correct, adjust the position and the length of the arm (if necessary change the wipe arc. Also see 5.3). Tighten the nuts properly now.

!

13. To complete the installation, the wiper must be enclosed by means of a panel or cover. Provide the wiper with sufficient ventilation.

Place a protection cover or panel.

Provide sufficient ventilation.



4 Operation and use

4.1 Preparation for first use

If the wiper has been installed and been adjusted, the system can be prepared for first use. We recommend a thorough inspection of the system to ensure proper operation.

Check:
… if there are no leaks where the bearings go through the window;
… if the set wipe arc cleans the entire window;
… if the park position is correct.

If the wipe arc or the park position is wrong, adjust them again. Follow the procedure in section 5.3.

4.2 Use

All Exalto windshield wipers are provided with the following functions:

- low speed;
- high speed;
- self parking.

Don't run the wiper on a dry window; excessive wear of the blades and the motor may occur in this case.

Because of the big variety of wiper switches, refer to the user manual of the installed switch to learn about the functions of that specific switch.

5 Maintenance

5.1 General maintenance

To keep the Exalto wiper in good condition, you are advised to:

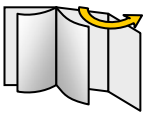
- clean wiper arms and wiper blades with fresh water after every journey in salt water (to prevent salt from clogging moving parts);
- prevent running the wiper on a dry window.

5.2 Servicing

As long as the wiper system functions normally and kept in good shape (see section 5.1), servicing the motor is not necessary. Check yearly (monthly when used intensively) if the wiper blades are worn. Replace blades when worn or when the blades leave many stripes across the glass. In case of failure or adjustments, have servicing done solely by qualified mechanics. In chapter 6, "Troubleshooting", a listing is given of possible troubles.

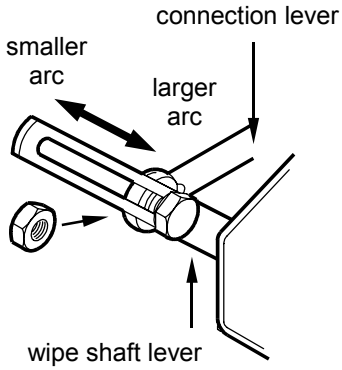
5.3 Changing the wipe arc and park position

If the wiped area is not optimal, the wipe arc and park position can be changed. Always disconnect the power supply before opening the housing.



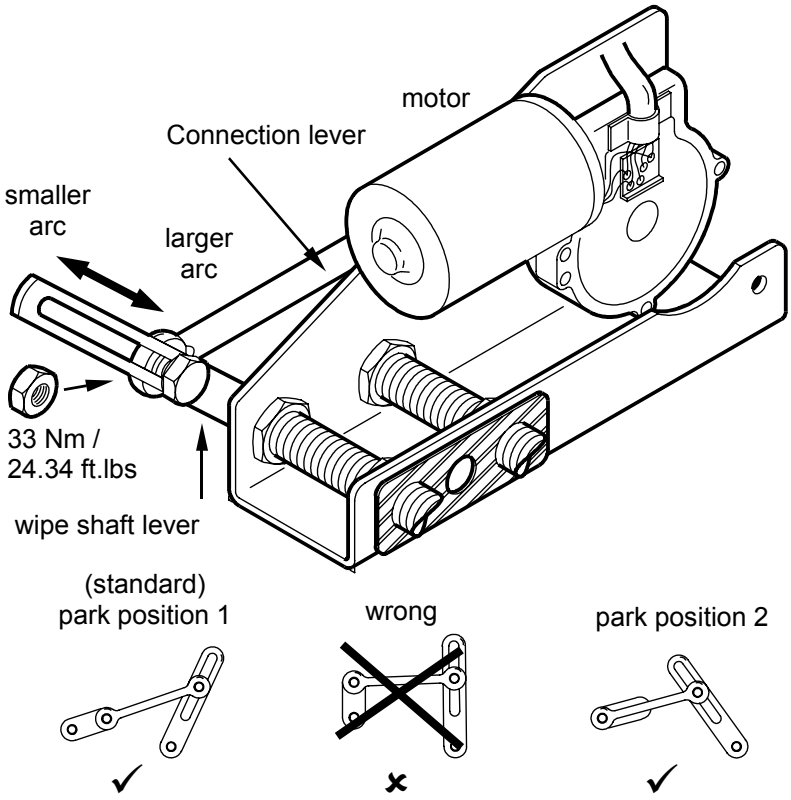
Adjusting the wipe arc

- Disconnect the power supply;
- loosen the nut of the wipe shaft lever (see figure on the right);
- move the pin away from the shaft for a smaller and towards the shaft for a larger wipe arc;
- fasten the nut again (max. 33 Nm / 24.34 ft.lbs);
- run the motor briefly to park it;
- place the motor lever in the desired park position (see the text below).



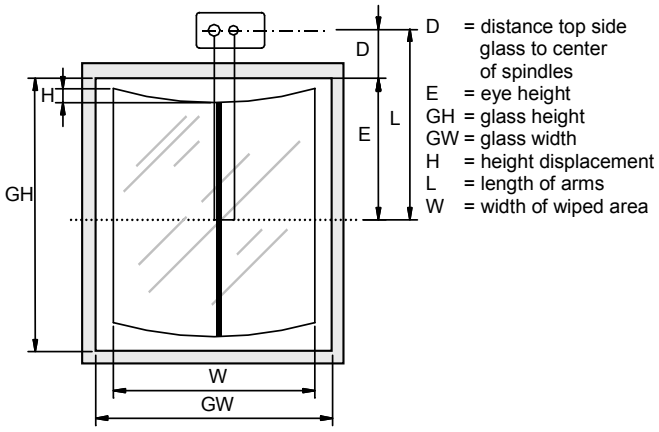
Adjusting the park position

- Place the motor lever loose on the shaft, parking right or left (see the drawing in paragraph 3.4 and below for reference);
- place the motor lever in such a way that it forms an almost straight line with the connection lever (see the drawing on the next page);
- tighten the motor lever well;
- mount the wiper-motor assembly;
- adjust the wiper arm to the correct length, if necessary.

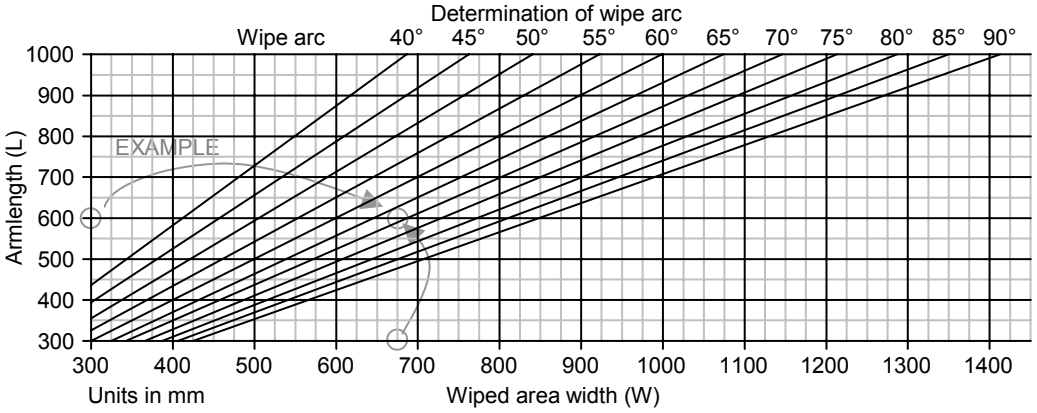


5.4 Rough determination of wipe arc and wiper blade

With this method the wipe arc and the wiper blade can be determined roughly. Contact your vendor to determine your configuration more accurately.



- Determine length of pantograph arm (L): ***L = E + D***
- get the maximum wiped area width (W): ***W = ±0.9 * GW***
- find the intersection of L and W in the diagram below;



- the wipe arc-line closest to the intersection, shows the wipe arc;

- find in the table below the vertical displacement of the blade (H);

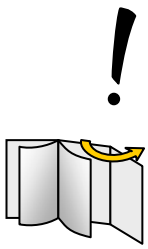
Determining the vertical displacement of the wiper blade

Armlength (L)		300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
Wipe arc	40°	19	21	25	26	30	34	37	40	43	45	48	51	54	57	60
	45°	23	27	30	35	38	42	46	50	53	57	61	65	68	72	76
	50°	26	33	36	43	47	52	56	61	66	70	75	80	84	89	94
	55°	34	40	45	51	57	62	66	74	79	85	90	96	102	107	113
	60°	40	47	54	60	67	74	80	87	94	100	107	114	121	127	134
	65°	47	55	63	71	79	86	94	102	110	117	125	133	141	149	157
	70°	55	63	73	81	90	100	109	118	127	136	145	154	163	172	181
	75°	62	73	83	93	104	114	124	135	145	155	165	176	186	196	207
	80°	70	82	94	105	117	129	140	152	164	175	187	199	211	222	234
	85°	79	92	105	119	132	145	158	171	184	197	210	223	236	250	263
	90°	86	103	117	132	146	161	176	190	205	220	234	249	264	278	293

Units in mm — Vertical displacement of the blade (H)

- Now the length of the wiper blade can be calculated:
  Length of wiper blade = 0.9 * 2 * (E - H)

5.5 Disassembly and assembly



To prevent injuries when disassembling: disconnect the wiper from the power supply. Keep all necessary tools within reach and remember the chapter on safety. Provide a protective packaging, if you're going to stock or transport the wiper.

5.5.1 Removing the wiper assembly from the bulkhead

1. Disconnect all the electric connections of the wiper.
2. Remove the wiper arms.
3. Remove the nuts (25, 18) and plates (22, 23) on the outside.
4. Remove the wiper from the bulkhead.
5. If you want to replace the wiper, follow the instructions of chapter 3.

5.5.2 Removing the motor from the wiper assembly

1. Disconnect all the electric connections and remove the wiper.
2. Disassemble the motor lever (9).
3. Unscrew the motor and remove it.
4. When replacing, screw the motor on the housing. Follow the instructions of section 5.3 to install the motor lever in the correct park position.

6 Troubleshooting

In this chapter, several malfunctions are mentioned combined with possible causes. Please leave servicing to qualified mechanics.

6.1 Wiper doesn't run after switching on

- Possible causes:
  1. Wiper switch is not working properly.
  2. Burned fuse.
  3. Electrical connections are incorrect or damaged.
  4. The wiper motor has failed.
- Solutions:
  1. Test and replace it.
  2. Check if the current is (and keeps being) too high. (See solution 1).
  3. Measure the voltage across the motor and check all connections if there is none.
  4. Replace the motor and check for drag or a high current.

6.2 Wiped area or park position not correct

- Possible causes:
  1. The wiper arms were placed without parking the motor first.
  2. The wipe arc is set wrong or changed due to high loads (e.g. spring pressure arms to high, drag).
  3. The wires are connected incorrectly.
- Solutions:
  1. Remove the wiper arms. Run the motor shortly to park it and re-install the arms according to chapter 3.
  2. Determine the wipe arc if needed (see section 5.4) and set the wipe arc again (see chapter 5.3).
  3. Check and reconnect the wiring (see the scheme in section 3.3).

6.3 Motor runs, but arms don't move

- Possible causes:
  1. Mechanical joints are loose.
  2. Parts are broken.
  3. Grooves of shafts are worn.
- Solutions:
  1. Check if the arms are well fastened. If not, open the housing (follow instructions of chapter 5) and check all joints and parts to see if they are loose, broken or worn.

7 Declaration of conformity

MANUFACTURER'S DECLARATION
according to Appendix II sub B of Directive 89/392/EEG (Machines)

Exalto B.V.
Nijverheidsstraat 12
3371 XE Hardinxveld-Giessendam
The Netherlands
☎ +31 (0)184-61.58.00
Fax: +31 (0)184-61.40.45

hereby declares that

Exalto windshield wiper type 250 BS

… is intended to be built into another machine or as a component, or is to be integrated with other machines to a machine where Directive 89/392/EEG applies to;

… **does not** fully comply to the requirements of mentioned Directive;

… complies to the following harmonised standards:

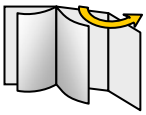
Pleasure yachts

- NEN-EN-ISO 10133 Extra-low voltage D.C. installations (1997) (regarding colour codes)

…and declares that the sub-assembly in question shall not be set into operation until the complete machine, into which the sub-assembly is fitted, shall be complete and conforms to all aspects of Directive 89/392/EEG.

Hardinxveld-Giessendam
6-15-2000 (m-d-y)

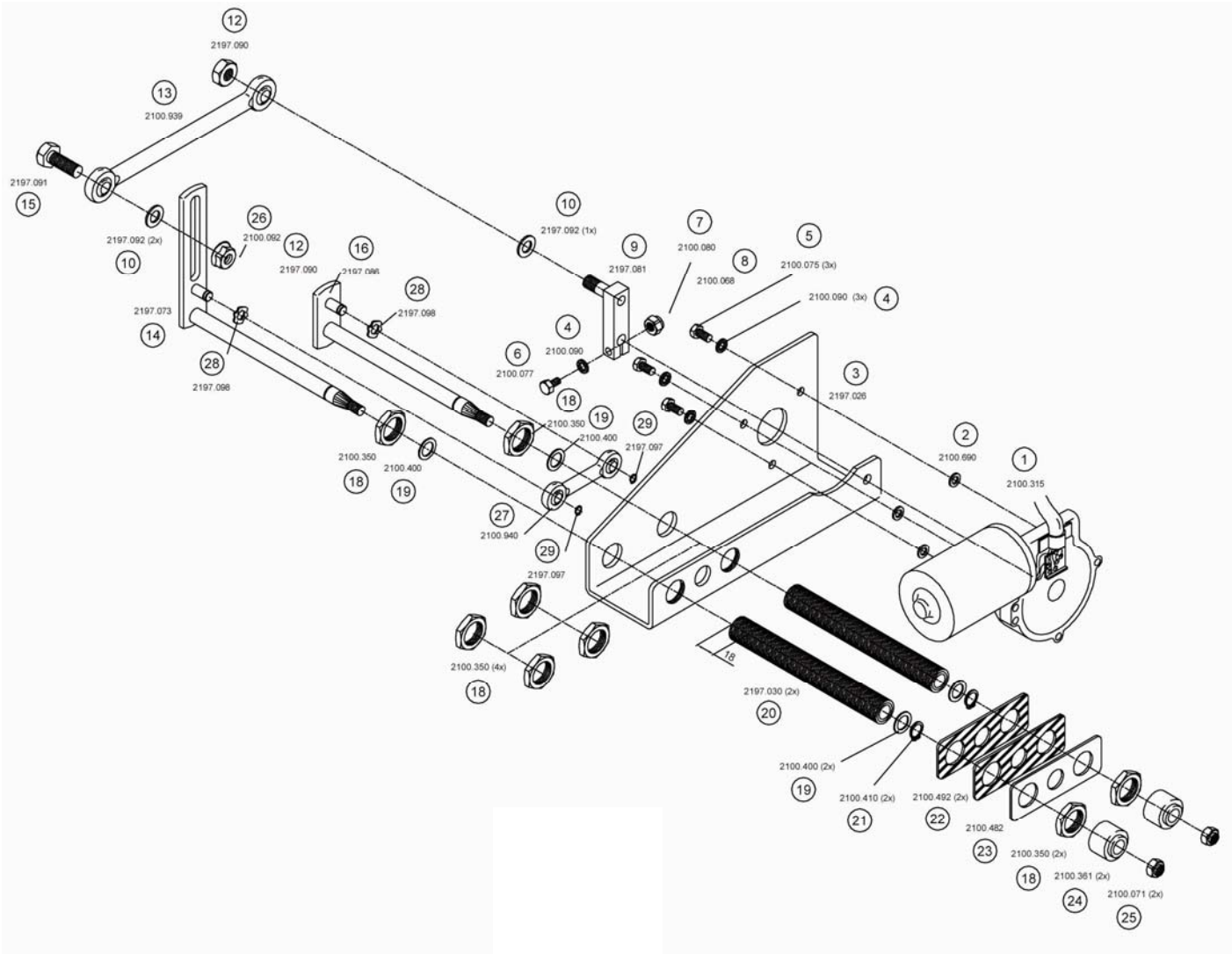
8 Parts list



Nr	Qua	Part	Dimensions	Cat. nr.
1	1	Motor 12 V 50 Nm	210x100x130	2100.315
		Motor 24 V 50 Nm	210x100x130	2100.325
2	3	Ring s.s. (DIN 125a)	M6	2100.690
3	1	Wiper housing for 250BS	250x73x125	2197.026
4	4	Serrated Lock washer s.s.	M6	2100.090
5	3	Hexagon head bolt s.s. (A4)	M6x16	2100.075
6	1	Hexagon head bolt s.s. (A4)	M6x25	2100.077
7	1	Nut s.s. (DIN934)	M6	2100.080
9	1	Motor lever + linking pin	60x16x36	2197.081
10	2	Ring s.s. (DIN 125A)	M10	2197.092
12	1	Nut s.s. (DIN934)	M10	2197.090
13	1	Push rod	200x26x14	2100.939
14	1	Shaft with lever + pin, bh 35 mm		2197.073
	1	Shaft with lever + pin, bh 65 mm		2197.074
15	1	Hexagon head bolt s.s. (A4)	M10x35	2197.091
16	1	Support shaft with lever + pin, bh 35mm		2197.086
	1	Support shaft with lever + pin, bh 65mm		2197.087
18	2	Nut 316 s.s.	M20x1	2100.350
19	4	Plain washer s.s.	18x12x1	2100.400
20	2	Bearing house, bh 35 mm	M20x151	2197.030
		Bearing house, bh 65 mm	M20x178	2197.031
21	2	Retaining ring for shaft (A4)	Ø12x1	2100.410
22	2	Gasket, rubber	105x45x3	2100.492
23	1	Gasket, s.s.	105x45x3	2100.482
24	2	Dust cap, rubber	Ø26x20	2100.361
25	2	Nut s.s., nylock A4	M8	2100.071
26	1	Hex. flange nut with teeth	M10	2100.069
27	1	Push rod	82x22x12	2100.940
28	6	Nut, 304 s.s.	M20x1	2100.349
29	2	Retaining ring	Ø 6mm	2197.097
30	2	Wave spring washer, A2	M8	2197.098

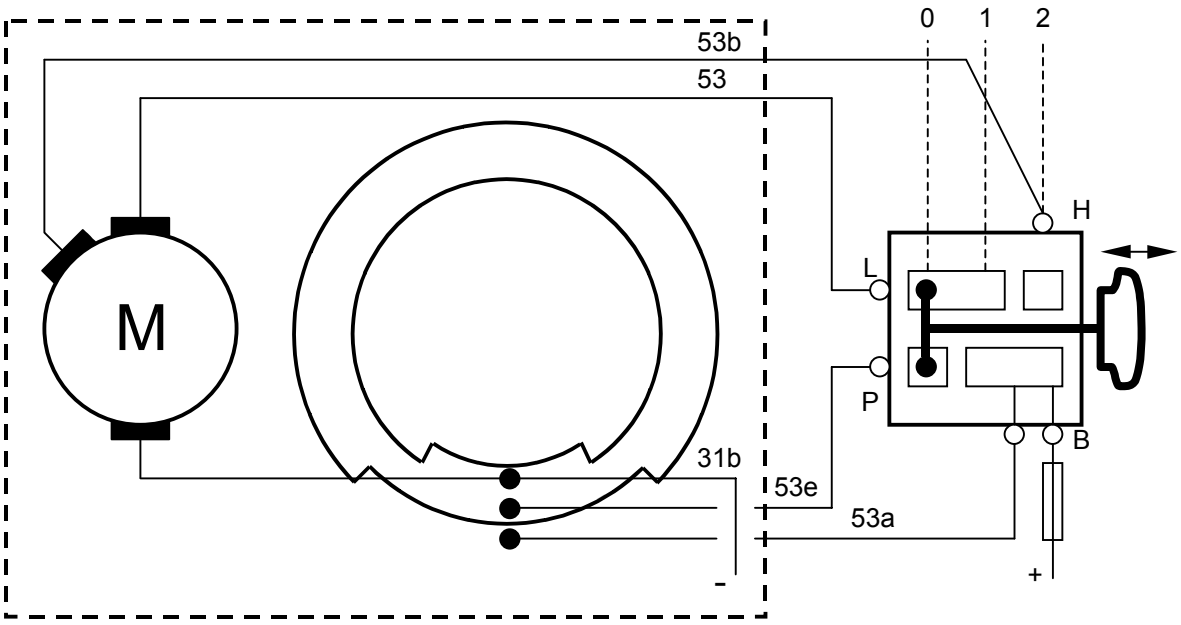
9 Drawings and schemes

9.1 Assembly overview



9.2 Internal wiring diagram

The following diagram is to help understand the principle of the wiper motor.



Function	Polarity	Motor code	Switch code	Cable (since 6-1999)
high speed	+	53b	H	white
low speed	+	53	L	yellow
earth	-	31b		black
common leg		53e	P	blue
parking	+	53a	B	red

Some older wipers may have different wire colours. Check the diagram below to compare the colour combinations.

Function	Current cable (since 6-1999)	Previous cables (before 6-1999)	
high speed	white	red	6
low speed	yellow	yellow or white	5
earth	black	blue	4
common leg	blue	green	3
parking	red	black	7

Exalto B.V.
Nijverheidsstraat 12 • 3371 XE Hardinxveld-Giessendam
P.O. Box 40 • 3370 AA Hardinxveld-Giessendam
Telephone: +31 (0)184-615800 • Fax: +31 (0)184-614045
The Netherlands
sales@exalto.com